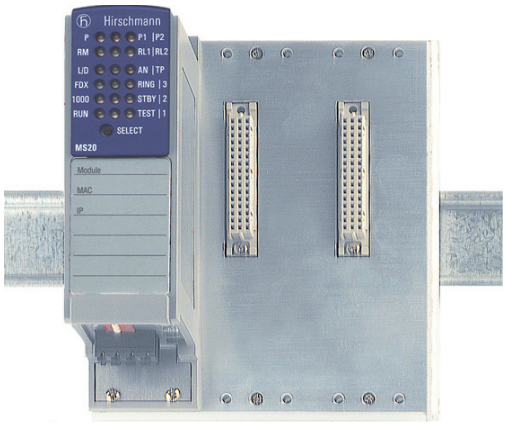
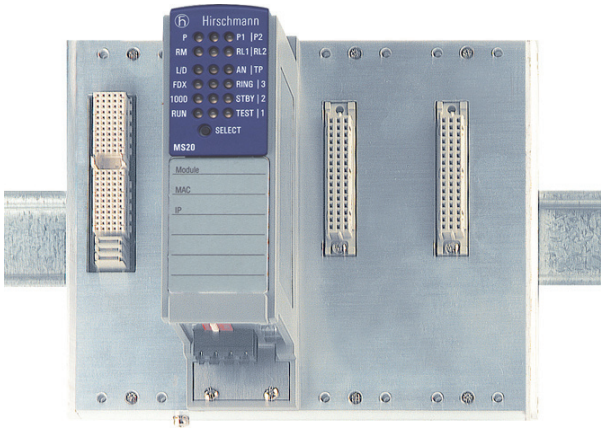
HIRSCHMANN
A BELDEN BRAND

User Manual

Installation
Industrial ETHERNET Switch MICE
MS20/MS30



MICE MS20



MICE MS30

03953000108010900 0

MICE MS20/MS30
Release 01/09

Technical Support
HAC-Support@hirschmann.de

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Printed in Germany
Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
Tel.: +49 1805 141538

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Safety instructions

This documentation contains instructions which must be observed to ensure your own personal safety and to avoid damage to devices and machinery.

Certified usage

Please observe the following: The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by the manufacturer. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Supply voltage

The devices are designed for operation with a safety extra-low voltage.Thus, they may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1.The supply voltage is electrically isolated from the housing.
The supply voltage is electrically isolated from the housing.

- ☐ Use only undamaged parts!
- ☐ Relevant for North America:
  The subject unit is to be suppplied by a Class 2 power source complying with the requirements of the National Electrical Code, table 11(b).
  If power is redundant supplied (two individual power sources) the power sources together should comply with the requirements of the National Electrical Code, table 11 (b).
- ☐ Relevant for North America:
  Use 60/75°C or 75°C copper(CU)wire only.
- ☐ Relevant for North America
  for devices certified for hazardous locations:
  Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA 70] and in accordance with the authority having jurisdiction.
- ☐ For devices installed in explosive gas atmospheres according to ATEX 100a (only for devices labelled accordingly):
  Relevant for Europe (ATEX 100a): ⟨Ex⟩ II 3G EEx nA IIC T4 - refer to the device label.
  Must be mounted in a suitable certified IP 54 housing –
  tested to 4 J impact due to low risk of mechanical danger.
  For ambient temperatures below -10 °C and above +60 °C use wiring suitable for both the minimum and maximum temperatures.

Shielding ground

The shielding ground of the connectable twisted pairs lines is connected to the front panel as a conductor.

- ☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Housing

Only technicians authorized by Hirschmann are permitted to open the housing.

The lower panel of the device is grounded by means of the hat rail and optionally by means of the separate ground screw.

- ☐ The switch basic module forms an inseparable unity. By removing the display and connecting parts, you risk the damage of the switch basic module.
- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.
- ☐ The ventilation slits must not be covered so as to ensure free air circulation.
- ☐ The clearance to the ventilation slits of the housing must be at least 10 cm.
- ☐ Never insert pointed objects (thin screwdrivers, wires, etc.) into the inside of the chassis! Failure to observe this point may result in injuries caused by electric shocks.
- ☐ The device has to be mounted in an upright position (see fig. 18).
- ☐ If installed in a living area or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristics according to EN 60950-1.

Environment

The device may only be operated at the specified maximum ambient temperature and relative air humidity (non-condensing).

- ☐ Install the device in a location where the climatic threshold values specified in the technical data are adhered to.
- ☐ Only to be used in an environment with the contamination level specified in the technical data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- trained in providing first aid.

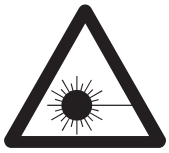
General safety instructions

This device is electrically operated. Adhere strictly to the safety requirements relating to voltages applied to the device as described in the operating instructions!

Non-observance of these safety instructions can therefore cause material damage and/or serious injuries.

- ☐ Only appropriately qualified personnel should work on this device or in its vicinity. These personnel must be thoroughly familiar with all the warnings and maintenance procedures in accordance with this operating manual.
- ☐ The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- ☐ Never start operation with damaged components!
- ☐ Only use the devices in accordance with this manual. In particular, observe all warnings and safety-related information.
- ☐ Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

Warning!
LED or LASER components in compliance with IEC 60825-1 (2001):
CLASS 1 LASER PRODUCT.
CLASS 1 LED PRODUCT



Warning
LED LIGHT (...-...P4... and ...-P9... POF media modules)
DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (e.g. lens, microscope). Failure to observe this warning within a distance of 100 mm can endanger your eyes. Light is emitted from the optical connections or from the ends of the optical fibers that are connected to them. Light Emitting Diode CLASS 2M, Wave length 650 nm, Power <2 mW, according to IEC/CEI 60825-1:2003-10.

National and international safety regulations

☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

ESD guidelines (MM... - ...P4...)

The media modules MM2-2FXP4 and MM3-4FXP4 contain components highly sensitive to electrostatic fields. These components can be easily destroyed or have their lives shortened by an electrical field or by a discharge caused by touching the contacts. You can find more information about devices vulnerable to electrostatic fields in DIN EN 61340-5-1 (2001-08) and DIN EN 61340-5-2 (2002-01).

Note on the CE marking

The devices comply with the regulations contained in the following European directives:

2004/108/EG
Directive of the European Parliament and the Council for standardizing the regulations of member states on electromagnetic compatibility.
In accordance with the above-named EU directives, the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Tel.: +49 1805 141538

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- Interference immunity: EN 61000-6-2:2005
- Emitted interference: EN 55022:2006 Class A

Warning!
This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.
The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC value limits.

FCC note:

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.
These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment.
The device creates and uses high frequencies and can radiate same, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

Recycling note

After usage, this product must be disposed of properly as electronic waste in accordance with the current disposal regulations of your county / state / country.

About this manual

The following manuals are included as PDF files on the enclosed CD ROM:

- User manual “Installation”
- User manual “Basic configuration”
- User manual “Redundancy configuration”
- Reference manual “Web-based Interface” and
- Reference manual “Command Line Interface”

The Network Management Software HiVision provides you with additional options for smooth configuration and monitoring:

- Event logbook.
- Configuration of “System Location“ and “System Name“.
- Configuration of the network address range and SNMP parameters.
- Saving the configuration on the device.
- Simultaneous configuration of multiple devices.
- Configuration of the port display color red for a connection error.

Legend

The commendations used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Device description

The MS20/MS30 devices consist of a switch with media modules that can be plugged into it. They allow you to construct switched industrial ETHERNET networks that conform to the IEEE 802. and 802.3u standards using copper wires or optical fibers in a bus or ring topology. You can connect terminal devices and other infrastructure components via twisted pair cables, multi-mode LWL and single-mode LWL. The twisted pair ports support auto-crossing, autonegotiation and autopolarity.

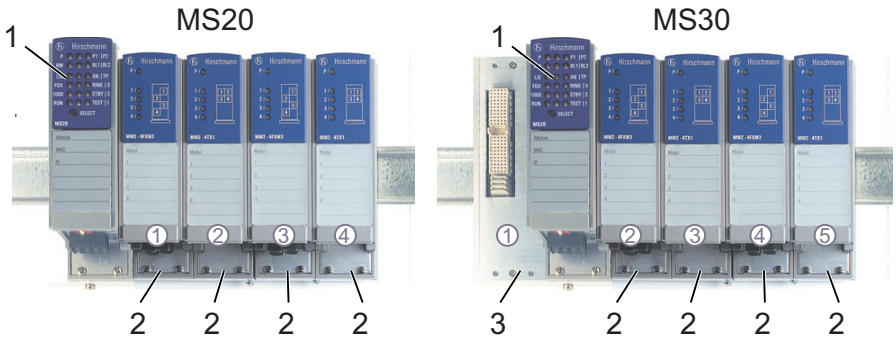


Figure 1: MICE basic module, equipped with media modules
1 - Basic module
2 - Media module
3 - Slot for media module

The MS20/MS30 devices provide you with a range of switch variants. You can set up your switch to meet your individual requirements with regard to the transmission media type, the number of 10/100 Mbit/s ports you want (8, 16 or 24), the number of 1000 Mbit/s ports (up to 2), the temperature range, voltage range, certificates and software variant.

The devices are modular network components. They are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility. The devices operate without fans and have a redundant voltage supply. The switches are very quickly mounted by snapping them onto a hat rail, which also automatically contacts the function ground.

The HIPER-Ring redundancy concept enables you to quickly carry out a reconfiguration, and also a simple configuration with only one additional connection. The diagnosis display and the display of the operating parameters and the large label areas provide a quick overview.
It can be easily managed via a Web browser, via Telnet, with a management software product (such as HiVision) or locally on the switch (V.24 interface).

Depending on the software you choose, the devices provide you with a large range of functions:

- Redundancy functions
  (Rapid Spanning Tree, Redundant Ring Structure, HIPER-Ring, Redundant Coupling, Link Aggregation, Redundant Power Supply)
- Protection from unauthorized access
- Synchronized system time in the network
- Network load control
- Function diagnosis
- Diagnostics (hardware self-testing)
- Reset
- Priority
- VLAN
- Topology discovery
- Web-based interface
- Command Line Interface - CLI
- SNMP
- 802.1x port authentication
- Real Time Clock (Professional software variant)

The addition, to the MS20/MS30 MICE range, of the RS20/RS30 Open Rail range of switches, the MACH range of backbone switches, the BAT wireless transmission system, the EAGLE security system, and products for the LION control room, provides continuous communication across all levels of the company.

1.1 Description of the device variants

The industrial ETHERNET series MICE (Modular Industrial Communication Equipment) consists of a basic switch module and the media modules. These devices can be managed. A basic module contains all the functions of this industrial Gerät, with the exception of the interfaces to the LAN that is connected. Pluggable media modules provide these interfaces. They differ with regard to the number of interfaces and the media type for connecting segments. An expansion module enables you to add 2 slots for media modules to the basic module.

For the sake of simplicity, the basic switch module with various plugged in media modules will be referred to as MICE in this document.

- The MS20-... device variants are modular switches with up to 8, 16 or 24 * 10/100 Mbit/s Ethernet ports. You can choose the media for the ports via the media modules.
- The MS30-... device variants are modular switches with up to 8, 16 or 24 * 10/100 Mbit/s Ethernet ports and up to 2 additional Gigabit ports (1000 Mbit/s Ethernet). You can choose the media for the ports via the media modules.

The devices also provide you with the following options for selecting the variant you desire:

- Temperature range:
  - Standard (0°C to 60°C)
  - Extended (-40°C to +70 °C) without Conformal Coating
  - Extended (-40°C to +70 °C) with Conformal Coating
- Voltage range:
  - 18 to 32 VDC (flatter basic module design)
  - 18 to 60 VDC (deeper basic module design)
- Certifications / Declarations:
  - CE, cUL508, ISA 12.12.01 (cUL1604)
  - CE, cUL508, ISA 12.12.01 (cUL1604), German Lloyd (GL), IEC/EN 61850-3 Declaration (Sub Station), IEEE 1613 (Sub Station), EN 50121-4 Railway (along track)
  - CE, cUL508, ISA 12.12.01 (cUL1604), German Lloyd (GL), IEC/EN 61850-3 Declaration (Sub Station), IEEE 1613 (Sub Station), EN 50121-4 Railway (along track), ATEX 100a (Hazardous Location)
  - CE, cUL508, ISA 12.12.01 (cUL1604), German Lloyd (GL), IEC/EN 61850-3 Declaration (Sub Station), IEEE 1613 (Sub Station), EN 50121-4 Railway (along track), EN 50155 Declaration (Railway)
- Software version: Enhanced or Professional

The devices comply with the specifications of the ISO/IEC standards
8802-3u 100BASE-TX/-1000BASE-T,
8802-3 100BASE-FX and
8802-3 1000BASE-SX/LX.

The basic module of the MICE contains all the function units, such as: switch function, management function, redundancy function, display control, voltage connection, management connection, adjustable controls, slots for media modules.

Family	Designed for
MS20	Larger numbers of ports, number of 100 Mbit ports desired, temperature range, voltage range, certificates and software variant can be selected.
MS30	Larger numbers of ports and larger bandwidth requirement, number of 100/1000 Mbit ports desired, temperature range, voltage range, certificates and software variant can be selected.

1.1.1 MS20-... and MS30-... combination options

The product designation of your MS20/MS30 device is made from combining the desired product characteristics in accordance with the following table. The short designation is in column 3.

Position	Attribute	Ident.	Feature
1 to 4	Produkt	MS20	Modular Switch without gigabit ports
		MS30	Modular Switch with gigabit ports
5	- (hyphen)	-	
6 to 7	Number of 10/100 Mbit ports	08	8 * 10/100 Mbit Ethernet
		16	16 * 10/100 Mbit Ethernet
		24	24 * 10/100 Mbit Ethernet
8 and 9	Number of 1000 Mbit ports	00	0 * 1000 Mbit Ethernet
		02	2 * 1000 Mbit Ethernet
14	Temperature range	S	Standard 0 °C to +60 °C
		T	Extended -40 °C to +70 °C
		E	Extended -40 °C to +70 °C, Conformal Coating
15	Votlage range	A	18 VDC to 32 VDC
		C	18 VDC to 60 VDC
16	Specifications	A	CE, UL
		H	CE, UL, GL, Bahn (along track), Sub Station
		B	CE, UL, GL, Bahn (along track), Sub Station, Hazardous Location (ATEX), Bahn (train)
17	Software variante	E	Enhanced
		P	Professional

Table 1: Combination options of the MS20/MS30 device versions

Example: MS30-0802SAAE

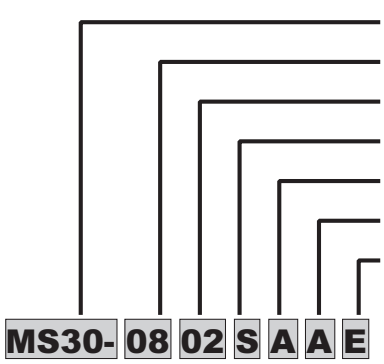
Product code			Product features
	MS30-	=	Modular switch with gigabit ports
	08	=	8 x 100 Mbit Ethernet ports
	02	=	2 x 1000 Mbit Ethernet ports
	S	=	Temperature range standard (0 °C to 60 °C)
	A	=	Voltage range 18 VDC to 32 VDC
	A	=	Specifications CE and UL
	E	=	Software version enhanced

Table 2: Example for product code: MS30-0802SAAE

1.1.2 Number of ports and connections

Device versions with 10/100 Mbit/s ports MS20-0800..., MS20-1600..., MS20-2400...

Depending on the variant, the MS20 basic modules provide you with the following number of slots for media modules and the following maximum number of connectable network segments:

Basic module	Number of slots for 10/100 Mbit media modules	Maximum number of connectable 10/100 Mbit network segments when connecting 4 port media modules
MS20-0800...	2	8
MS20-1600...	4	16 [1]
MS20-2400...	6	24

1. Expandable to 24 ports with MB2-T expansion module

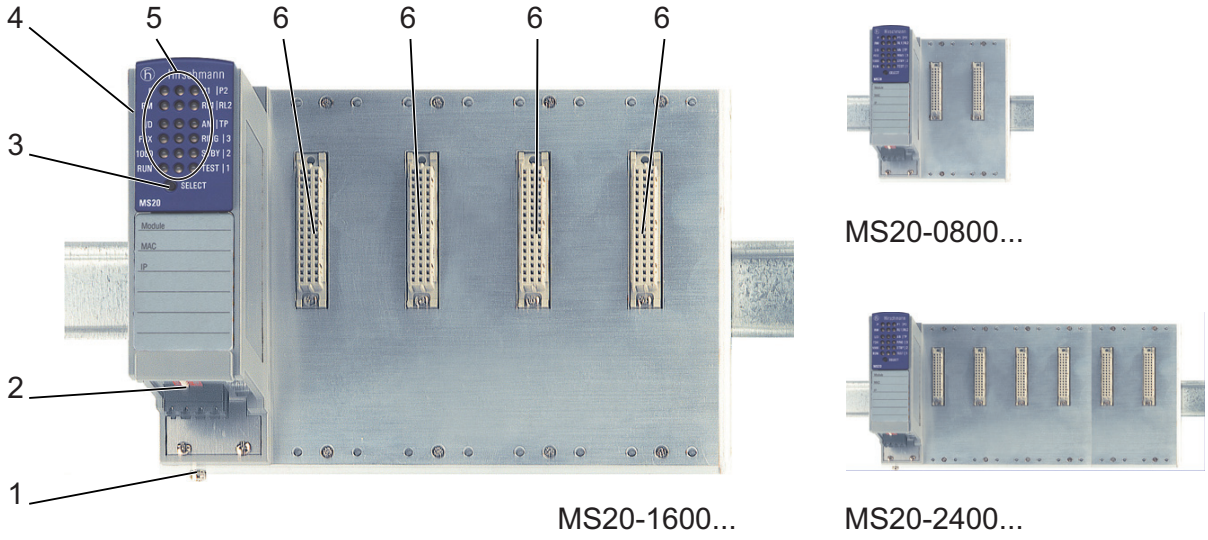


Figure 2: Overview interfaces, display elements and controls of the MS20 -...
1 - Grounding screw
2 - Terminal block, V.24 port, USB port, DIP switch
3 - Key for display status
4 - Switch basic module MS20-...
5 - LEDs for device status, display status
6 - 4 slots for media modules MM2-... or MM3-... with 2-4 ports each

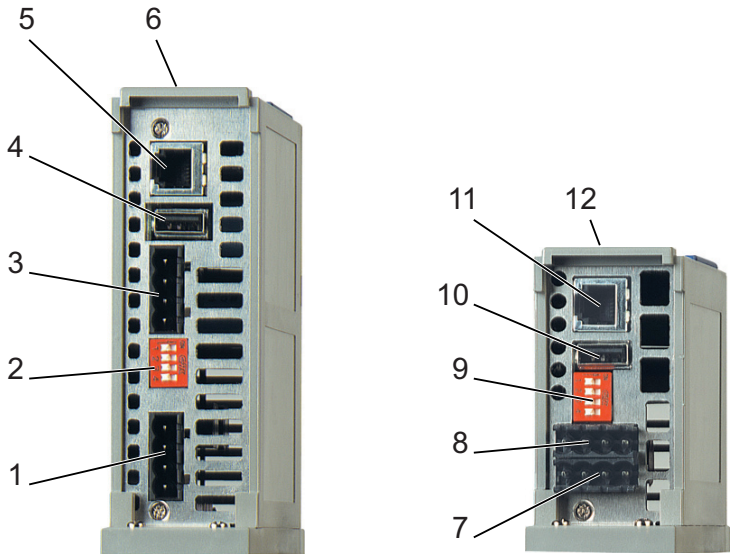


Figure 3: Interfaces of the MS20-... and MS30-... on the bottom of the device
1 - Terminal block (power 2)
2 - DIP switch
3 - Terminal block (power 1)
4 - USB port
5 - V.24 port
6 - MICE MS20/30 switch basic module with 18 to 60 VDC voltage range
7 - Terminal block (power 2)

8 - Terminal block (power 1)
9 - DIP switch
10 - USB port
11 - V.24 port
12 - MICE MS20/30 switch basic module with 18 to 32 VDC voltage range

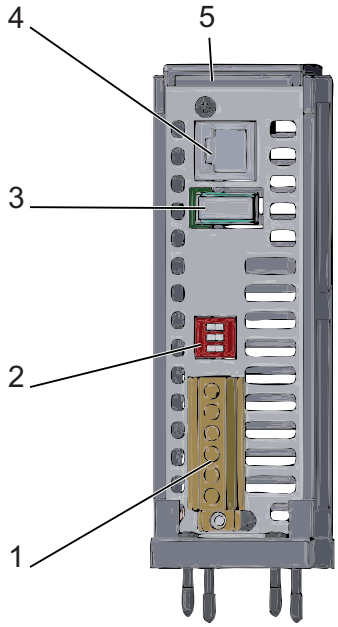


Figure 4: Connections of the MS20-.../MS30-...E on the bottom of the device
1 - Terminal block 6-pin for power and signal contact
2 - DIP switch
3 - USB port
4 - V.24 port
5 - MICE MS20/30-...E... switch basic module with 18 to 60 VDC voltage range / 6-pin

Device variants with 1000 Mbit/s and 10/100 Mbit/s ports MS30-0802..., MS30-1602..., MS30-2402...

Depending on the variant, the MS30 basic modules provide you with the following number of slots for media modules and the following maximum number of connectable network segments:

Basic module	Number of slots for 10/100 Mbit/S media modules	Number of slots for 1000 Mbit/S media modules	Max. possible number of connectable 10/100 Mbit/S network segments when connecting 4-port media modules	Max. possible number of connectable 1000 Mbit/s network segments
MS30-0802...	2	1	8	2
MS30-1602...	4	1	16 [1]	2
MS30-2402...	6	1	24	2

1. Can be expanded to 24 ports with the MB2-T expansion module

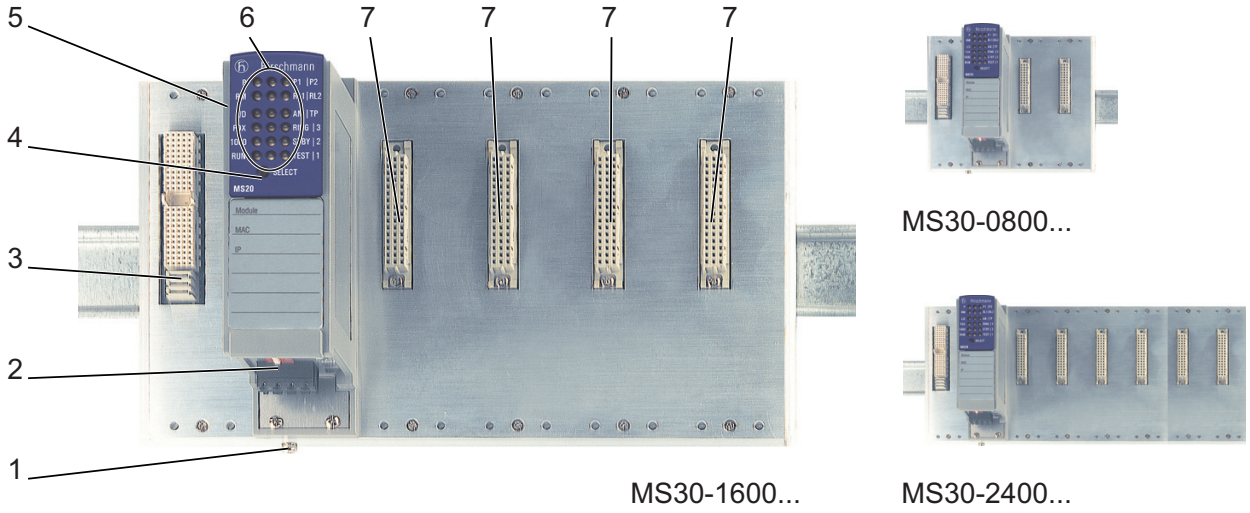


Figure 5: Overview of interfaces, display and operating elements on the MS30
1 - Grounding screw
2 - Terminal block, V.24 port, USB port, DIP switch
3 - Slot for SFP module MM4-TX/SFP
4 - Key for display status
5 - Switch basic module MS30-...
6 - LEDs device status, display status
7 - 4 slots for media modules MM2-... or MM3-... with 2 to 4 ports each

The figure (see fig. 3) shows the connections on the bottom side of the MS30.

1.1.3 Media modules

The MICE media modules form the interface of the device to the LAN. They can be attached in the

- Basic module MS20-...
- Basic module MS30-...

They differ with regard to the number of interfaces and media type. The various interfaces of the MICE media modules offer you the following interface-specific functions:

- Specific functions of the TP/TX interface
  - Link Control
  - Auto Polarity Exchange
  - Autonegotiation
  - Autocrossing (it does not matter whether you connect devices using a cross-over or straight cable)
- Specific functions of the F/O interface
  - Link Control
- Transceiver- (AUI-) specific functions
  - Collision detection
  - Collision Test (SQE)

- Jabber-Control
- DTEPower monitor

MICE 2000 media modules

MICE 2000 media modules Module type	AUI port	TP ports 10/100 Mbit/s	F/O port multi-mode 10 Mbit/s	F/O port multi-mode POF 100 Mbit/s	F/O port multi-mode 100 Mbit/s	F/O port single-mode 1300 nm, 100 Mbit/s	F/O port single-mode 1550 nm, 100 Mbit/s
MM2 - 4TX1 (- EEC)	–	4, RJ45	–	–	–	–	–
MM2 - 2FLM4	–	–	2, ST	–	–	–	–
MM2 - 2FXP4	–	–	–	2, ST	–	–	–
MM2 - 4FXM3	–	–	–	–	4, MTRJ	–	–
MM2 - 2FXM3 / 2TX1	–	2, RJ45	–	–	2, MTRJ	–	–
MM2 - 2FXM2	–	–	–	–	2, DSC	–	–
MM2 - 2FXS2	–	–	–	–	–	2, DSC	–

Table 3: Media connections per MICE 2000 media modules (number and type)

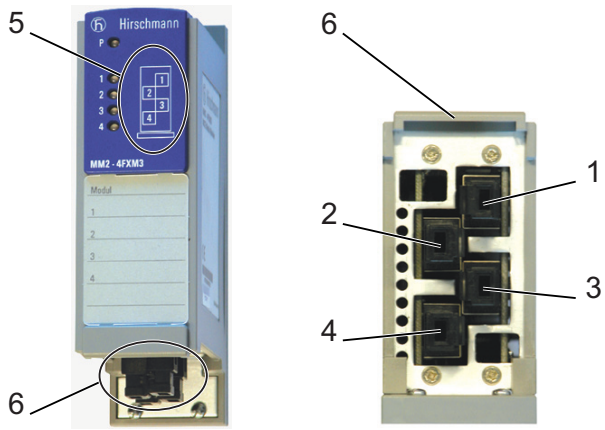


Figure 6: Port assignment
1 - Port 1
2 - Port 2
3 - Port 3
4 - Port 4
5 - Illustration of the port numbers
6 - Bottom side of the device

MICE 3000 media modules

MICE 3000 media modules Module type	AUI port	TP ports 10/100 Mbit/s	F/O port multi-mode 10 Mbit/s	F/O port multi-mode POF 100 Mbit/s	F/O port multi-mode 100 Mbit/s	F/O port single-mode 1300 nm, 100 Mbit/s	F/O port single-mode 1550 nm, 100 Mbit/s
MM3-2AUI	2, Sub-D	–	–	–	–	–	–
MM3-4TX5	–	4, M12	–	–	–	–	–
MM3-4TX1-RT	–	4, RJ45	–	–	–	–	–
MM3-2FLM4/2TX1-RT	–	2, RJ45	2, ST	–	–	–	–
MM3-4FLM4	–	–	4, ST	–	–	–	–
MM3-4FXP4	–	–	–	4, ST	–	–	–
MM3-1FXM2/3TX1	–	3, RJ45	–	–	1, DSC	–	–
MM3-2FXM2/2TX1(-EEC)	–	2, RJ45	–	–	2, DSC	–	–
MM3-2FXM2/2TX1-RT	–	2, RJ45	–	–	2, DSC	–	–
MM3-2FXM4/2TX1	–	2, RJ45	–	–	2, ST	–	–
MM3-4FXM2	–	–	–	–	4, DSC	–	–
MM3-4FXM4	–	–	–	–	4, ST	–	–
MM3-1FXS2/3TX1(-EEC)	–	3, RJ45	–	–	–	1, DSC	–
MM3-2FXS2/2TX1	–	2, RJ45	–	–	–	2, DSC	–
MM3-2FXS2/2TX1-RT	–	2, RJ45	–	–	–	2, DSC	–
MM3-4FXS2	–	–	–	–	–	4, DSC	–
MM3-1FXL2/3TX1	–	3, RJ45	–	–	–	–	1, DSC

Table 4: Media connections per MICE 3000 media modules (number and type)

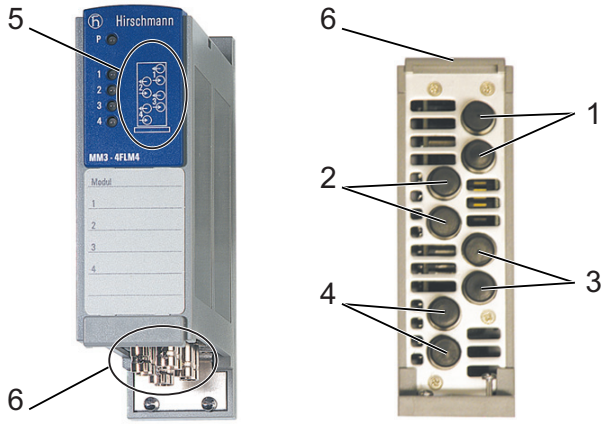


Figure 7: Portzuordnung
1 - Port 1
2 - Port 2
3 - Port 3
4 - Port 4
5 - Illustration of the port numbers
6 - Bottom side of the device

MM22-T1T1T1T1 PoE media module

The MM22-T1T1T1T1 PoE media module (deeper module design) supports Power over ETHERNET (PoE) according to IEEE 802.3af. It allows the connection and remote supply of IP telephones (Voice over IP), webcams, sensors, printer servers and WLAN access points via 10BASE-T/100BASE-TX, for example. With PoE, these terminal devices are powered by the twisted-pair cable.

The MM22-T1T1T1T1 media module has four 10BASE-T/100BASE-TX ports (RJ45 connections) for connecting network segments or PoE terminal devices (PD, Powered Device) up to class 0 (or respectively class 3).

The current is supplied on the free line pair (spare pairs); the individual ports are not electrically insulated from each other.
The following conditions are met in accordance with IEEE 802.3af:

- Endpoint PSE
- Alternative B.

MICE 4000 media modules

The 2-port MM4 - 2TX/SFP media module has two TP interfaces and two sockets for Hirschmann SFP modules.

The 4-port MM4 - 4TX/SFP media module can also be used in the MS20/MS30. It has four TP interfaces and four sockets for Hirschmann SFP modules. The gigabit slot of the MS30 (slot on the left side next to the switch basic module) supports two ports.

Every slot allows you to replace a TP interface with an optical interface using an SFP module. By inserting the SFP module you deactivate the corresponding TP interface.

Note: Only use Hirschmann SFP modules (see table 16).

MICE 4000 media modules Module type	TP ports 10/100/1000	SFP ports as an alternative to TP ports
MM4 - 2TX/SFP	2, RJ45	2
MM4 - 4TX/SFP	4, RJ45	4

Table 5: Media connections per MICE 4000 media modules (number and type)

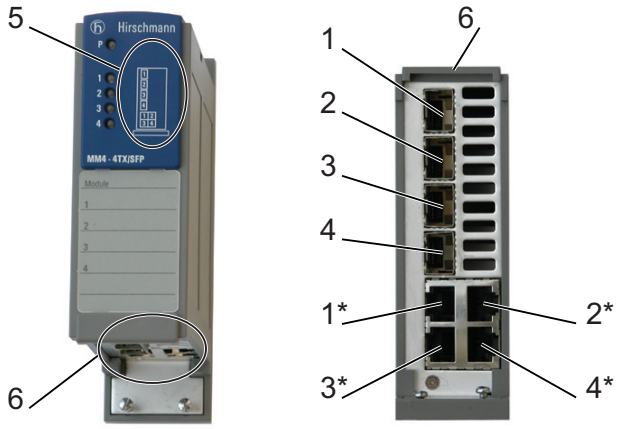


Figure 8: Port assignment
1 - Port 1 (twisted pair)
2 - Port 2 (twisted pair)
3 - Port 3 (twisted pair)
4 - Port 4 (twisted pair)
1 - Port 1* (SFP slot, attachable alternatively to port 1)*
2 - Port 2* (SFP Slot, attachable alternatively to port 2)*
3 - Port 3* (SFP Slot, attachable alternatively to port 3)*
4 - Port 4* (SFP Slot, attachable alternatively to port 4)*
5 - Illustration of the port numbers
6 - Bottom side of the device

1.1.4 MB-2T expansion module

The MB-2T expansion module allows you to expand the basic MS20-1600 / MS30-1602 MICE modules by two slots for media modules.

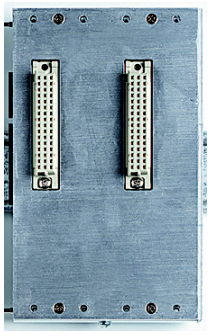


Figure 9: MB-2T expansion module

1.1.5 SFP modules

SFP modules are optical transceivers (Fast ETHERNET and Gigabit ETHERNET SFP modules (see table 16). SFP stands for Small Form-factor Pluggable and is often named mini-GBIC (GigaBit Interface Converter).

The SFP modules are plugged into the SFP slots of the Fast ETHERNET media module MM20-Z6Z6Z6Z6... or of the Gigabit ETHERNET media modules MM4-4TX/SFP / MM4-2TX/SFP to provide a F/O port.
The MM20-Z6Z6Z6Z6... has four slots for SFP modules (100 Mbit/s).

The MM4-4TX/SFP / MM4-2TX/SFP has four/two TP interfaces and four/two slots for SFP modules (100/1000 Mbit/s).
Inserting the SFP module deactivates the corresponding TP interface.

Module type	Transmission	Range	Connection
M-SFP-SX/LC	850 nm multimode	0.55 km	LC
M-SFP-LX/LC	1330 nm multimode 1330 nm singlemode	0.55 km 20 km	LC LC
M-SFP-LH/LC	Long Haul	8-72 km	LC
M-SFP-LH+/LC	Long Haul +	60-120 km	LC

Table 6: SFP modules

2 Assembly and start-up

The devices have been developed for practical application in a harsh industrial environment. The installation process is correspondingly simple.

On delivery, the device is ready for operation.
The following procedure has been proven to be successful for the assembly of the device:

- Unpack and check
- Install the media modules
- Fill out and attach labels
- Install the SFP modules
- Adjust the DIP switch settings on the basic module (4-pin DIP switch)
- Adjust the DIP switch settings on the MS20/MS30-...E... basic module (3-pin DIP switch)
- Adjust the DIP switch settings on the MICE MM3-2AUI media module
- Connect the MM22-T1T1T1T1 PoE media module
- Connect the terminal block for voltage supply and signal contact, connect the supply voltage
- Install the terminal block, start-up procedure
- Install the basic module on the hat-rail hub, grounding
- Install the data lines
- Define the meaning of the display LEDs
- Install the MB-2T expansion module

2.1 Installing the device

2.1.1 Unpacking and checking

☐ Check whether the contents of the package are complete (see on page 52 "Scope of delivery").
☐ Check the individual parts for transport damage.

2.1.2 Installing the media modules

On delivery, the device is ready for operation.
You can install and remove media modules during running operation.

☐ To attach a media module, first remove the protective cap on the plug.
☐ Plug the media module onto the plug.
☐ Fasten the 4 screws at the corners of the media module.
☐ Fit the media modules in sequence from left to right.
☐ Check whether the switch default settings match your requirements.

2.1.3 Filling out and attaching labels

The labels included in the scope of delivery help you to organize your network installation clearly.

The large label areas enable you to designate the modules and uniquely assign the devices to be connected. You can print them, write on them and exchange them at any time.

Figure 10: Attaching the labels

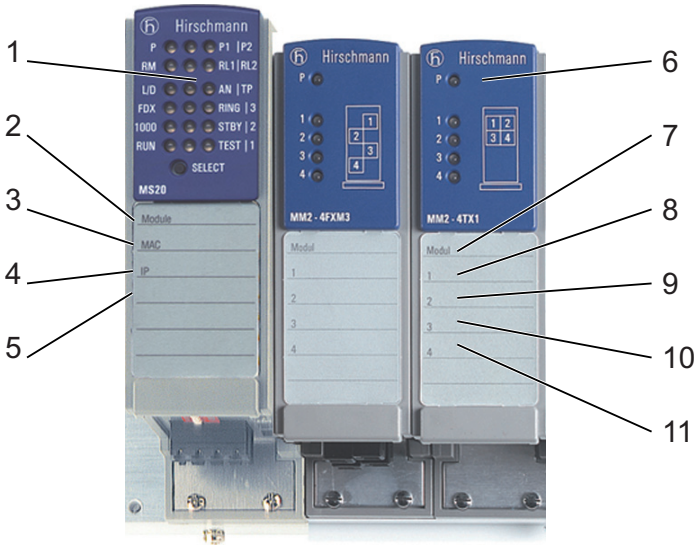


Figure 11: Labels for basic modules and media modules

1 - MICE basic module
2 - Lable for the name of the module
3 - Lable for MAC address of the device
4 - Lable for IP address of the device
5 - Lable for other entries on your demand
6 - MICE media module

7 - Lable for the name of the media module
8 - Lable for the port assignment of the media module (port 1)
9 - Lable for the port assignment of the media module (port 1)
10 - Lable for the port assignment of the media module (port 1)
11 - Lable for the port assignment of the media module (port 1)

☐ Attach the labels included in the delivery to the basic module and the media modules as required.

2.1.4 Installing the SFP modules

☐ To attach an SFP module, first remove the protective cap over the socket.
☐ Push the SFP module with the lock closed into the socket until it latches audibly in place.

Note: Only use Hirschmann SFP modules.

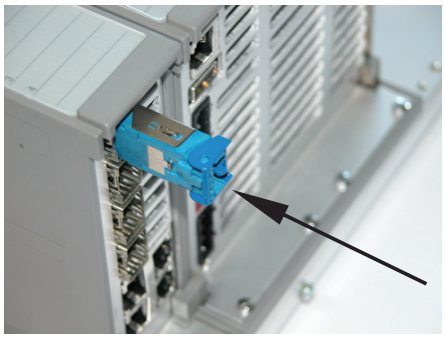


Figure 12: Installing an SFP module

2.1.5 Adjusting the DIP switch settings on the basic module (4-pin DIP switch)

The 4-pin DIP switch on the bottom panel of the basic module gives you the following options:

DIP switch	Function	State on delivery
RM (redundancy manager) [1]	When the HIPER-Ring function is switched on, you can switch the RM (Redundancy Manager) function on and off (see "User Manual - Redundancy Configuration").	OFF position (RM function deactivated)
Ring port [2]	Selecting the ports for the HIPER-Ring MS30: In the ON position, ports 1 and 2 in module 2 form the connection for the HIPER-Ring. MS20: In the ON position, port 1 from modules 1 and 2 form the connection for the HIPER-Ring.	OFF position (ports 1 and 2 in module 1 form the connection for the HIPER-Ring).
Stand-by [1]	With the redundant coupling of rings, you assign the redundancy function to the MICE in the redundant line (see "User Manual - Redundancy Configuration").	OFF position (normal function)
Software Configuration / DIP Configuration	Give the software configuration precedence over of the DIP switch position. In this case, the other switch positions are meaningless.	ON position (software configuration has precedence)

1. You can use the "RM" and "Stand-by" switches on the 4-pin DIP switch to switch the following functions on and off (see table 8)
2. The "Ringport" switch on the 4-pin DIP switch enables you to select the ring ports for the HIPER-Ring (see table 7)

Switch "Ring port" position	MICE device	Ring ports for the HIPER-Ring
OFF	MS20	Module 1/ port 1 and module 1/ port 2
ON	MS20	Module 1/ port 1 and module 2 / port 1
OFF	MS30	Module 1/ port 1 and module 1 / port 2
ON	MS30	Module 2 / port 1 and module 2 / port 2

Table 7: Selecting ring ports for the HIPER-Ring

RM switch position	Stand-by switch position	Ring redundancy	Coupling switch	Ring manager	Coupling manager	Ring port	Control port	Coupling port
OFF	OFF	on	on	off	off	see above		
ON	OFF	on	on	on	off	see above		
OFF	ON	on	on	off	on	see above	Module 1/ port 3 (MS20) module 2/ port 3 (MS30)	Module 1/ port 4 (MS20) module 2/ port 4 (MS30)
ON	ON	off	off	off	off			

Table 8: Switching redundancy mode and stand-by on/off

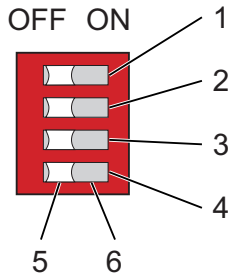


Figure 13: 4-pin DIP switch on the MICE basic module MS20-.../MS30-...
1 - Switch 1, Function: Redundancy Manager (RM)
2 - Switch 2, Function: Ring port
3 - Switch 3, Function: Stand-by
4 - Switch 4, Function: Configuration
5 - Switch position OFF
6 - Switch position ON

☐ Before starting operation of the device, check whether the default settings of the DIP switch correspond to your requirements.

2.1.6 Adjusting the DIP switch settings on the MS20/MS30-...E... basic module (3-pin DIP switch)

The 3-pin DIP switch on the bottom panel of the basic module gives you the following options:

DIP switch	Function	State on delivery
RM (redundancy manager) [1] [2]	When the HIPER-Ring function is switched on, you can switch the RM (Redundancy Manager) function on and off (see "User Manual - Redundancy Configuration").	OFF position (RM function deactivated)
Ring port [2] [3]	Selecting the ports for the HIPER-Ring MS30: In the ON position, ports 1 and 2 in module 2 form the connection for the HIPER-Ring. MS20: In the ON position, port 1 from modules 1 and 2 form the connection for the HIPER-Ring.	OFF position (ports 1 and 2 in module 1 form the connection for the HIPER-Ring).
Stand-by [1] [2]	With the redundant coupling of rings, you assign the redundancy function to the MICE in the redundant line (see "User Manual - Redundancy Configuration").	OFF position (normal function)

1. You can use the "RM" and "Stand-by" switches on the 3-pin DIP switch to switch the following functions on and off (see table 8)
2. All three DIP switches ON: Software configuration
3. The "Ringport" switch on the 3-pin DIP switch enables you to select the ring ports for the HIPER-Ring (see table 7)

Switch "Ring port"	MICE device	Ring ports for the HIPER-Ring
OFF	MS20	Module 1/ port 1 and module 1/ port 2
ON	MS20	Module 1/ port 1 and module 2 / port 1
OFF	MS30	Module 1/ port 1 and module 1 / port 2

Table 9: Selecting ring ports for the HIPER-Ring

RM switch position	Stand-by switch position	Ring redun-dancy	Coup-ling switch	Ring manager	Coupling manager	Ring port	Control port	Coup-ling port
OFF	OFF	on	on	off	off	see above		
ON	OFF	on	on	on	off	see above		
OFF	ON	on	on	off	on	see above	Module 1/ port 3 (MS20) module 2/ port 3 (MS30)	Module 1/ port 4 (MS20) module 2/ port 4 (MS30)

Table 10: Switching redundancy mode and stand-by on/off

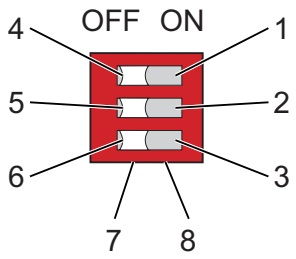


Figure 14: 3-pin DIP switch on the MICE basic module MS20/MS30-...E...
1 - Switch 1, position ON, Function: Redundancy Manager (RM)
2 - Switch 2, position ON, Function: Mod. 1 Port 1 & Mod. 2 Port 1
3 - Switch 3, position ON, Function: Stand-by
4 - Switch 1, position OFF, Function: -
5 - Switch 2, position OFF, Function: Ring Port: Mod. 1 Port 1 & 2
6 - Switch 3, position OFF, Function: -
7 - Switch position OFF
8 - Switch position ON

☐ Before starting operation of the device, check whether the default settings of the DIP switch correspond to your requirements.

2.1.7 Adjusting the DIP switch settings on the MICE MM3-2AUI media module

With the 3-pin DIP switch in the bottom panel of the MM3-2AUI media module, you enter settings for the SQE test function and for monitoring the DTE voltage.

Note: Before starting operation, check whether the device in question operates the transceiver with or without an SQE test.

☐ Before starting operation of the device, check whether the default settings of the DIP switch correspond to your requirements.

2.1.8 Connecting the MM22-T1T1T1T1 PoE media module

The MM22-T1T1T1T1 PoE media module with PoE voltage (48 V DC safety low voltage) is supplied with power by an external power supply unit. The PoE voltage is fed into the 3-pin terminal block of the PoE media module. The twisted-pair cables at ports 1 to 4 are supplied with PoE voltage via the spare pairs (pins 4&5 and 7&8 of the RJ45 sockets).

Note: Only use the Hirschmann RPS60/48V EEC power supply unit to supply the PoE voltage.

☐ Make sure that the external power supply unit you use to provide the PoE voltage fulfils the following basic prerequisites:
- Insulation requirements according to IEEE 802.3af (insulation resistance 48 V output to "rest of the world" 2250 V DC for 1 min.).
- Output power < 100 W.
- Current limitation < 2 A.
- Power supply unit and PoE media module form a "limited power source" according to IEC60950-1.
- The external PoE power supply unit must be able to provide the power for the connected PDs.

The RPS60/48V EEC power supply unit meets these requirements.

Note: The RPS60/48V EEC does not fulfill the requirements according to the Germanischer Lloyd requirement, criteria EMC1 relating to conducted emissions on the 230 V AC side. If this requirement must be fulfilled, connect a corresponding power supply unit that fulfils both this requirement **and** the basic requirements.

☐ Connect the PoE voltage to the 3-pin terminal block included in the scope of delivery as shown in the following diagram.
Make sure the the following requirements are met:
- Supply line length < 3 m.
- Supply line cross section is suitable for 1.5 A.

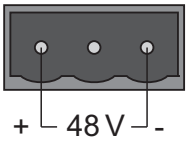


Figure 15: 3-pin terminal block on the PoE media module

☐ Mount the terminal block for the PoE supply voltage on the bottom of the PoE module using the snap lock. Make sure it latches securely in place.

Note: Use 4-pair twisted pair cables to connect the terminal devices. Only connect terminal devices conforming to IEEE 802.3af.

2.1.9 Terminal block for supply voltage and signal contact

The supply voltage and the signal contacts are connected via a 4-pin terminal block and a redundant 4-pin terminal block with a snap lock.

Supply voltage

The supply voltage can be connected redundantly. Both inputs are uncoupled. There is no distributed load. With redundant supply, the power supply unit supplies the Switch alone with the higher output voltage. The supply voltage is electrically isolated from the housing.

Note: With non-redundant supply of the main voltage, the device reports a power failure. You can prevent this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

Signal contacts

- The signal contacts are used for the remote monitoring of the device to enable remote diagnostics. You can specify the type of function monitoring in the Management.
- You can also use the Management to set the signal contact manually and thus control external devices.

A break in contact is used to report the following conditions via the potential-free signal contact (relay contact, closed circuit):

- The failure of at least one of the two voltage supplies (voltage supply 1 or 2 is below the threshold value).
- A continuous malfunction in the device (internal supply voltage).
- The defective link status of at least one port. The report of the link status can be masked by the Management for each port. In the default state, link status monitoring is deactivated.
- The temperature threshold has been exceeded or has not been reached.

- The removal of the ACA.

The following condition is also reported in RM mode:

- Ring redundancy guaranteed. By default, there is no ring redundancy monitoring

2.1.10 Connecting the terminal blocks, start-up procedure

☐ Pull the terminal block off the device and connect the voltage supply lines and the signal lines.

Terminal blocks on MS20/MS30-...A... and MS20/MS30-...C...

Products with voltage range A or C (product code position 15 (see table 1) have two 4-pin terminal blocks.

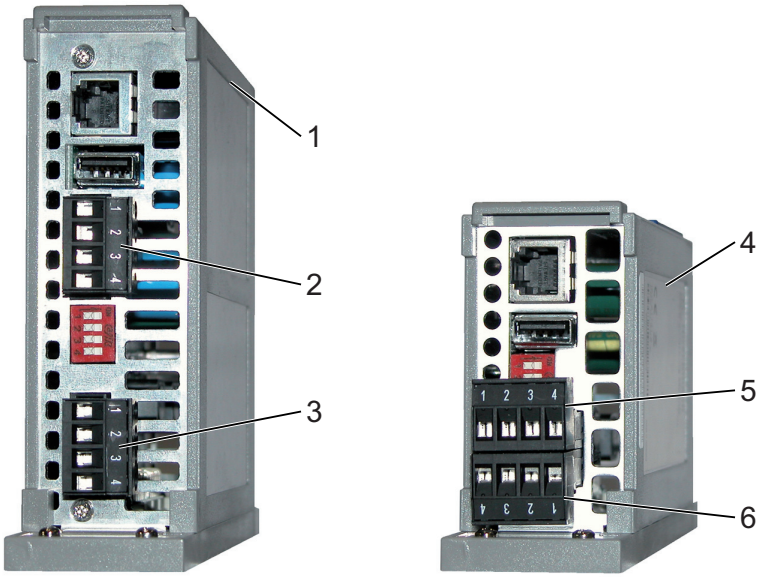


Figure 16: Pin assignment of the 4-pin terminal blocks

1 - MS20/30 switch basic module with 18 to 60 VDC voltage range
2 - Power/signal contact 1:
Pin 1 =+24 V (P1), Pin 2 =0 V, Pin 3, 4 =Relay 1
3 - Power/signal contact 2:
Pin 1 =+24 V (P2), Pin 2 =0 V, Pin 3, 4 =Relay 2
4 - MS20/30 switch basic module with 18 to 32 VDC voltage range
5 - Power/signal contact 1:
Pin 1 =+24 V (P1), Pin 2 =0 V, Pin 3, 4 =Relay 1
6 - Power/signal contact 2:
Pin 1 =+24 V (P2), Pin 2 =0 V, Pin 3, 4 =Relay 2

Terminal block on MS20/MS30-...E...

Products with voltage range E (product code position 15 (see table 1)) have one 6-pin terminal block.

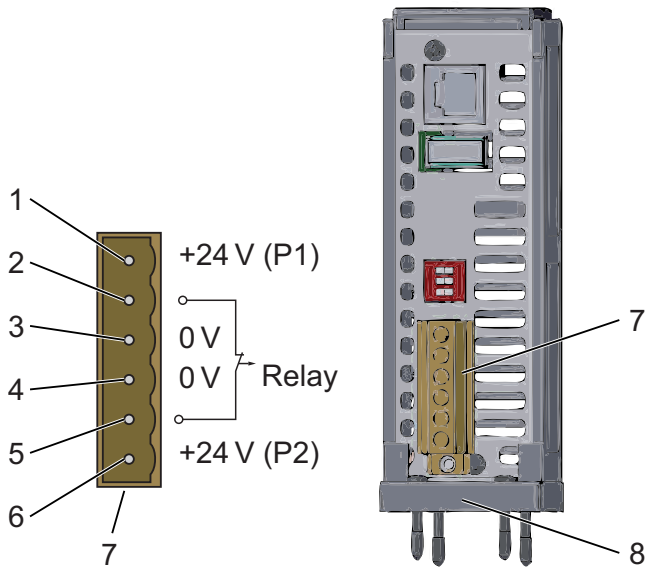


Figure 17: Pin assignment of the 6-pin terminal block

1 - Pin 1 = +24V (P1)
2 - Pin 2 = Relay
3 - Pin 3 = 0 V
4 - Pin 4 = 0 V
5 - Pin 5 = Relay
6 - Pin 6 = +24V (P2)
7 - Terminal block for power and signal contact
8 - MICE MS20/30-...E... switch basic module with 18 to 60 VDC voltage range /6-pin

Startup procedure

☐ Mount the terminal blocks for the voltage supply and signal contact on the bottom of the device using the snap locks. Make sure that the snap lock snaps into place.

By connecting the voltage supply via the terminal blocks, you start the operation of the device.

2.1.11 Installing the device on the hat-rail hub, grounding

☐ Mount the device on a 35 mm hat rail in accordance with DIN EN 60175.
☐ Attach the upper snap-in guide of the device into the hat rail and press it down against the hat rail until it snaps into place.

Note: The shielding ground of the industrial connectable twisted pair lines is connected to the lower panel as a conductor.

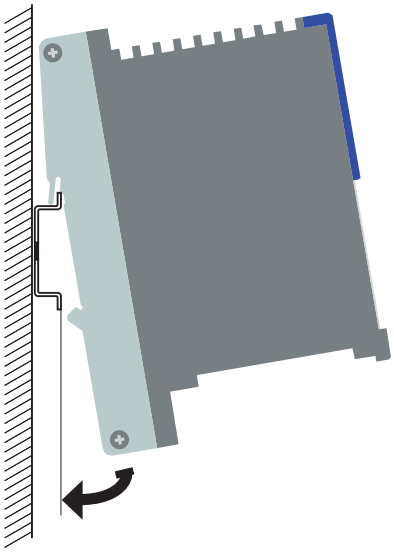


Figure 18: Assembly

Grounding

The lower panel of the device housing is grounded by means of the hat rail and optionally by means of the separate ground screw (see fig. 2).

2.1.12 Installing the data lines

10/100 Mbit/s twisted pair connection

10/100 Mbit/s ports (RJ45 or M12 sockets) allow the connection of terminal devices or independent network segments according to the IEEE 802.3 100BASE-TX / 10BASE-T standard. These ports support:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery condition: Autonegotiation activated except for the HIPER-Ring port: 100 Mbit/s, full duplex

The socket housing is electrically connected to the bottom panel.

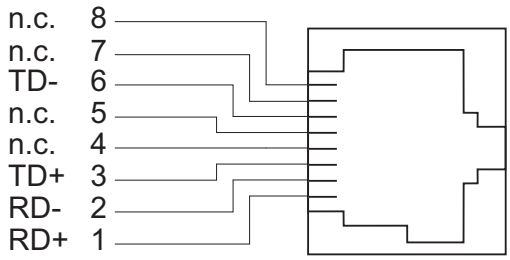


Figure 19: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

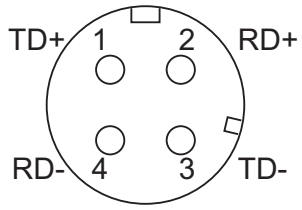


Figure 20: Pin assignment of a TP/TX interface, M12 socket

10/100 Mbit/s twisted pair connection on MM22-T1T1T1T1 PoE media module

10/100 Mbit/s ports (RJ45 sockets) allow the connection of terminal devices or independent network segments according to the IEEE 802.3 100BASE-TX / 10BASE-T and IEEE 802.3af (Power over ETHERNET on data lines) standards. These ports support:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- Power over ETHERNET

Delivery condition: Autonegotiation activated except for the ring port: 100 Mbit/s, full duplex. The socket housing is electrically connected to the front panel. The PoE voltage is fed in via pins 4&5 and 7&8 (spare pins).

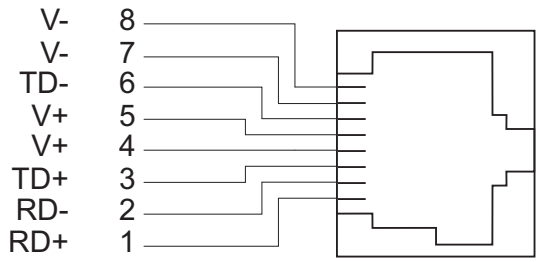


Figure 21: Pin assignment of the TP/TX interface for PoE for supply via the free line pairs (spare pairs), RJ45 plug

10/100/1000 Mbit/s twisted pair connection

1000 Mbit/s twisted pair ports (RJ45 sockets) allow the connection of terminal devices or independent network segments according to the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-T standard. These support:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 1000 Mbit/s, full duplex
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery condition: Autonegotiation

The socket housing is electrically connected to the front panel. The pin assignment corresponds to MDI-X.

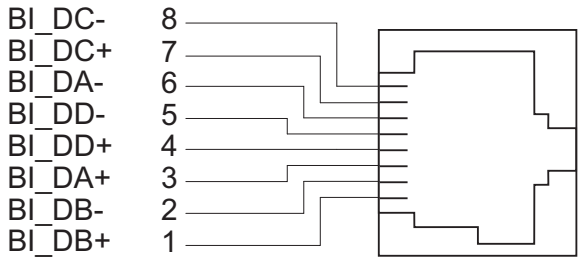


Figure 22: Pin assignment of the 1000 Mbit/s twisted pair interface

100 Mbit/s-F/O connection

100 Mbit/s F/O ports (MTRJ, ST or DSC) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard. These ports support:

- Full or half-duplex mode

Delivery condition: Full duplex

Note: Make sure that the LH ports are only connected with LH ports, SM ports are only connected with SM ports and MM ports only with MM ports.

1 Gbit/s-F/O connection

1 Gbit/s-F/O ports (LC sockets) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-SX or 1000BASE-LX standards. These ports support:

- Autonegotiation
- Full duplex mode

Delivery condition: Autonegotiation

Note: Make sure that the LH ports are only connected with LH ports, SX ports are only connected with SX ports and LX ports only with LX ports.

AUI connection

AUI ports (Attachment Unit Interface) enable you to connect a terminal device via an AUI cable in accordance with IEEE 802.3-2002. These ports support:

- SQE test
- DTEPower-Monitor

Delivery condition: Both functions not enabled. The housing of the Sub-D plug is electrically isolated from the lower panel of the device.

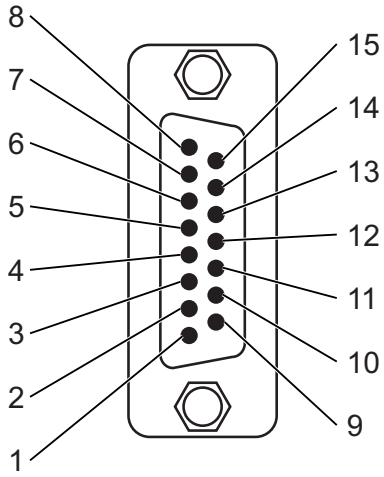


Figure 23: Pin assignment of an AUI interface

1 - Pin 1: Shielding CI
2 - Pin 2: Output CI-A
3 - Pin 3: Input DO-A
4 - Pin 4: Shielding DI
5 - Pin 5: Output DI-A
6 - Pin 6: GND
7 - Pin 7: not connected
8 - Pin 8: Shielding CO
9 - Pin 9: Output CI-B
10 - Pin 10: Input DO-B
11 - Pin 11: Shielding DO
12 - Pin 12: Output DI-B
13 - Pin 13: Voltage 12 V
14 - Pin 14: Shielding 12 V
15 - Pin 15: not connected

Connect the ports of the media modules plugged into the basic module as required in order to set up your industrial ETHERNET or expand your existing network.

☐ Install the data lines according to your requirements.

2.1.13 Installing the MB-2T expansion module

The MB-2T expansion module allows you to expand the basic MS20-1600 and MS30-1602 module with two sockets for media modules. You can install the MB-2T expansion module in running operation.

- ☐ On the right side of the module, loosen the screws at the top and bottom (1-3 revolutions).
- ☐ Take off the side panel.
- ☐ If you have not already done so, mount the basic module on the hat rail.
- ☐ Push the MB-2T expansion module on the hat rail to the basic module until the modules are plugged together.
- ☐ Tighten the screws on top and bottom of the basic module again.

2.1.14 Defining the meaning of the display LEDs

You use the "SELECT" button on the basic module to define the meaning of the LEDs of the media modules. You press the button to switch to the next display meaning. The display status LEDs of the basic module show the current meaning of the port LEDs of the media modules.

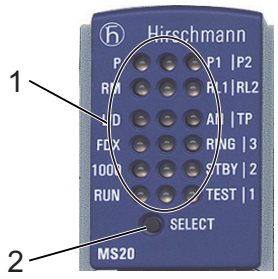


Figure 24: "SELECT" button on the MICE basic modules
1 - Display LEDs
2 - “SELECT” key

2.2 Display elements

After establishing the operating voltage, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up. The process lasts around 60 seconds.

Figure 25: Display elements on MS20/MS30

1 - Device status
2 - Display status
3 - Port status

Device status

These LEDs provide information about conditions which affect the operation of the whole device.

P - Power (green LED)	
Glowing green	Internal supply voltage present.
Not glowing	Internal supply voltage is too low.
P1 - Power 1 (green LED)	
Glowing green	Supply voltage 1 is present.
Not glowing	Supply voltage 1 is less than 18 V.
P2 - Power 2 (green LED)	
Glowing green	Supply voltage 2 is present.
Not glowing	Supply voltage 2 is less than 18 V.
RM - Redundancy Manager (green/yellow LED)	
Glowing green	RM function activeredundant port disabled.
Glowing yellow	RM function active, redundant port enabled.
Not glowing	RM function not enabled.
Flashing green	Incorrect configuration of the HIPER-Ring (e.g. the ring is not connected to the ring port).
RUN - BOOT/RUN (green LED)	
Glowing green	System is ready for operation.
Flashing green	System is booting.
Not glowing	System is in reset mode.
RL1 - Relay 1, signal contact (red/yellow LED)	
Glowing red	Signal contact 1 is open, i.e. it is reporting an error.
Glowing yellow	Signal contact 1 is open, the "Manual Setting" is active
Not glowing	Signal contact 1 is closed, i.e. it is not reporting an error.

RL2 - Relay 2, signal contact (red/yellow LED)	
Glowing red	Signal contact 2 is open, i.e. it is reporting an error.
Glowing yellow	Signal contact 2 is open, the "Manual Setting" is active
Not glowing	Signal contact 2 is closed, i.e. it is not reporting an error.
RUN, 1 - display saving processes of the AutoConfiguration Adapter (ACA)	
Flashing alternately	Error during saving process.
LED's flash synchronously, two times a second	Loading configuration from the ACA.
LED's flash synchronously, once a second	Saving the configuration in the ACA.

If the manual adjustment is active on the signal contact, then the error display is independent of the setting of the signal contact.

Display status

Every media module has one LED per port. The meaning of this port status LED depends on the setting on the basic module. You define the display meaning with the "SELECT" button on the basic module.

☐ Press the button for approx. 2 seconds to switch the meaning of the display. If the button is not pressed for approx. 20 seconds, the the display status changes back to "L/D".

L/D - data, link status (green LED)	Meaning
Glowing green	The port LEDs of the media modules display the connection status.
FDX - full duplex (green LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the half-duplex or full duplex connection status.
1000 - 10/100/1000 Mbit/s (green LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the set transmission speed.
AN - autonegotiation (green LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the port configuration type.
RING - ring port (green LED)	**Meaning**
Glowing green	The port LEDs of the media modules display HIPER-Ring assignment.
STBY - stand-by (green LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the assignment to a redundant coupling of network segments.

TEST - LED test (green LED)	Meaning
Glowing green	The status, display status and port status LED test is active. The P1/P2 LEDs glow green. The "RM" LED status flashes green/yellow. The RELAY1/RELAY2 status LEDs flash yellow/red. The display status LEDs flash green. The port status LEDs of the media modules flash green/yellow.
TP - twisted pair / fiber optic (green LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the media type.
All display status LEDs (green LEDs)	**Meaning**
Flashing in sequence	Initialization phase after restart
2 - PoE status (green/yellow LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the Power over ETHERNET status.
Not glowing	- No PoE port or PoE disabled. - PoE status "fault".
3 (green LED)	**Meaning**
	Service LED

Port status

These LED's display port-related information. You set the content of the information with the button on the basic module. (see on page 40 "Display status").

1 to 4 - data, link status (green/yellow LED)	
Not glowing	No valid connection. No DTE voltage at the port (for MM3-2AUI).
Glowing green	Valid connection. DTE voltage present at the port (for MM3-2AUI).
Flashing green (once a period)	Port is switched to stand-by (Port 1).
Flashing green (3 times a period)	Port is switched off.
Flashing yellow	Data reception.
1 to 4 - FDX (green/yellow LED	
Not glowing	Half-duplex is active.
Glowing green	Half-duplex is active.
1 to 4 - 1000 (green/yellow LED)	
Not glowing	10 Mbit/s is active.
Glowing green	100 Mbit/s is active.
Glowing yellow	1000 Mbit/s is active.
1 to 4 - AUTONEG (green/yellow LED)	
Glowing green	Autonegotiation is active.

1 to 4 - RING PORT (green/yellow LED)	Meaning
Glowing green	This port is assigned to the HIPER-Ring.
1 to 4 - STAND-BY (green/yellow LED)	**Meaning**
Glowing green	Connection port for the data line.
Glowing yellow	Connection port for the control line.
Flashing green/yellow	No stand-by partner available.
TP/FO - twisted pair / fiber optic (green/yellow LED)	**Meaning**
Glowing green	The port LEDs of the media modules display the twisted pair ports.
Glowing yellow	The port LEDs of the media modules display the F/O ports.
PoE status (green/yellow LED)	**Meaning**
Not glowing	No PoE port or PoE disabled; PoE status "fault".
Glowing yellow	PoE port searching for terminal device (PD); PoE status "searching".
Glowing green	PoE port supplying terminal device (PD); PoE status "delivering power".
1 to 4 - LED TEST (green/yellow LED)	**Meaning**
Not glowing	LED defective.
Flashing green/yellow	LED test is active.

2.3 Making basic settings

The IP parameters must be entered when the device is installed for the first time. The device provides 6 options for configuring IP addresses:

- Entry via V.24 connection
- Entry using the HiDiscovery protocol
- Configuration via BOOTP
- Configuration via DHCP
- Configuration via DHCP Option 82
- Auto Configuration Adapter

Further information on the basic settings of the device can be found in the "Basic Configuration" user manual on the CD ROM.

Default settings

- IP address: The device looks for the IP address using DHCP
- Management password:
  user, password: public (read only)
  admin, password: private (read and write)
- V.24 data rate: 9,600 Baud
- Ring redundancy: off

- Ethernet ports: link status is not evaluated (signal contact)
- Optical 100 Mbit/s ports: 100 Mbit/s full duplex
  All other ports: autonegotiation
- Redundancy manager switched off
  (DIP switch RM and Stand-by: ON)
- Stand-by coupling switched off
  (DIP switch RM and Stand-by: ON)
  Port 3 = control port, port 4 = coupling port for redundant ring coupling
- Rapid Spanning Tree: on

USB interface

The USB socket has an interface for the local connection of an AutoConfiguration Adapter ACA 21-USB. It is used for saving/loading the configuration and for loading the software.

Contact number	Signal name
1	VCC
2	- Data
3	+ Data
4	Ground

V.24 interface (external management)

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with appropriate terminal emulation) or an AutoConfiguration Adapter ACA 11. This enables a connection to the Command Line Interface (CLI) and the system monitor to be made.

VT 100 terminal settings	
Speed	9,600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device. The V24 interface is not electrically isolated from the supply voltage.

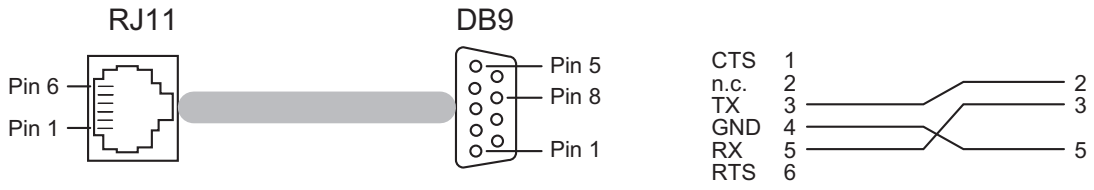


Figure 26: Pin assignment of the V24 interface

Note: You will find the order number for the terminal cable, which is ordered separately, in the Technical Data chapter (see on page 45 "Technical data").

2.4 Disassembly

Disassembling the device

☐ To remove the device from the hat rail, press the device downwards and pull it out from under the hat rail.

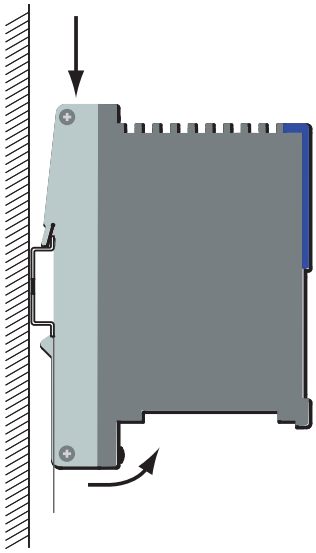


Figure 27: Disassembly

Disassembling the SFP modules

☐ Pull the SFP module by the opened lock out of the socket.
☐ Close the socket with the protective cap.

Figure 28: Disassembling an SFP module

3 Technical data

General technical data

Dimensions W x H x D	MS20-0800...	125 mm x 133 mm x 100 mm (140 mm[1])
	MS30-0802...	163 mm x 133 mm x 100 mm (140 mm[1])
	MS20-1600...	202 mm x 133 mm x 100 mm (140 mm[1])
	MS30-1602...	240 mm x 133 mm x 100 mm (140 mm[1])
	MS20-2400...	278 mm x 133 mm x 100 mm (140 mm[1])
	MS30-2402...	316 mm x 133 mm x 100 mm (140 mm[1])
Weight	MS20-0800...	610 g (700 g[1])
	MS30-0802...	740 g (830 g[1])
	MS20-1600...	880 g (970 g[1])
	MS30-1602...	1010 g (1100 g[1])
	MS20-2400...	1030 g (1120 g[1])
	MS30-2402...	1160 g (1250 g[1])

1. At 48 V DC voltage supply (voltage range C (18...60 V DC), see table 1"Combination options of the MS20/MS30 device versions" on page 14).

Power supply	Operating voltage	18 to 32 V DC (voltage range A) or 18 to 60 V DC (voltage range C) Safety extra-low voltage (SELV/PELV) redundant inputs disconnected. Relevant for North America: Nec Class 2 power source max. 5A.
Overload current protection at input		Non-replaceable fuse
Isolating voltage between operating voltage connectors and housing	Devices with input voltage range:18 V DC bis 32 V DC18 V DC bis 60 V DC	800 V DCThe isolating voltage is limited to45 V DC (1 mA) 90 V DC (1 mA) by protective components.
Signal contact		max. 1 A, 60 V DC or 30 V AC
Environment	Storage temperature (ambient air temperature) Humidity Atmospheric pressure	Standard: -40 °C to +70 °C Extended: -40 °C to +85 °C 10% to 95% (non condensing) Up to 2000 m (795 hPa), higher altitudes on request
Operating temperature	Standard Extended	0 °C to +60 °C -40 °C to +70 °C
Contamination level		2
Protection classes	Laser protection Protection class	Class 1 according to EN 60825-1 (2001) IP 20

EMC and immunity

EMC interference immunity		**A[1]**	**B[1]**	**H[1]**	**C[1]**
EN 61000-4-2	Electrostatic discharge				
	Contact discharge	4 kV	8 kV	8kV	8 kV
	Air discharge	8 KV	15 kV	15 kV	15 kV
EN 61000-4-3	Electromagnetic field (80 - 2700 MHz)	10 V/m	20 V/m	20 V/m	20 V/m

EMC interference immunity		A[1]	B[1]	H[1]	C[1]
EN 61000-4-4	Fast transients (burst)				
	- Power line	2 kV	4 kV	4kV	4 kV
	- Data line	1 kV	4 kV	4 kV	4 kV
EN 61000-4-5	Voltage surges				
	- Power line, line/line	0,5 kV	1 kV	1 kV	1 kV
	- power line, line/earth	1 kV	2 kV	2 kV	2 kV
	- data line	1 kV	2 kV	4 kV	2 kV
EN 61000-4-6	Conducted interference voltages 150 kHz - 80 MHz	10 V	10 V	10 V	10 V
EN 61000-4-9	Impulse-type magnetic fields	-	300 A/m	300 A/m	300 A/m
EMC emitted interference		**A[1]**	**B[1]**	**H[1]**	**C[1]**
EN 55022	Class A	Yes	Yes	Yes	Yes
FCC 47 CFR Part 15	Class A	Yes	Yes	Yes	Yes
Germanischer Lloyd	Klassifikations- und Bauvorschriften VI-7-3 Part 1	-	Yes	Yes	Yes
Stability		**A[1]**	**B[1]**	**H[1]**	**C[1]**
Vibration	IEC 60068-2-6 Test FC test level according to IEC 61131-2	Yes	Yes	Yes	Yes
	Germanischer Lloyd Richtlinien für die Durchführung von Baumusterprüfungen Teil 1	-	Yes	Yes	Yes
	IEC 870-2-2 table 3 Normal Installation according to EN61850-3	-	Yes	Yes	Yes
	EN 61373, Category 1, Class A (broadband noise), Requirements according to EN 50155	-	-	-	Yes
Shock	IEC 60068-2-27 Test Ea test level according to IEC 61131-2	Yes	Yes	Yes	Yes
	IEC 870-2-2 Tabelle 3 Normal, Anforderungen entsprechend EN61850-3	-	Yes	Yes	Yes
	EN 61373, Category 1, Class A, Requirements according to EN 50155	-	-	-	Ja

1. Product code A: Certification = CE, UL
   Product code B: Certification = CE, UL, GL, railway (along track), substation, ATEX
   Product code H: Certification = CE, UL, GL, railway (along track), substation
   Product code C: Pending: Certification = CE, UL, GL, railway (along track), substation, railway (train)
   (see on page 14 "MS20-... and MS30-... combination options")

Network range

AU port	
Length of an AUI cable	max. 50 m

Table 11: AUI port

TP port	
Length of a twisted pair segment	max. 100 m (cat5e cable with 1000BASE-T)

Table 12: TP port 10BASE-T / 100BASE-TX / 1000BASE-T

Product code		Wave-length	Fiber	System attenua-tion	Expan-sion	Fiber data
-F4	MM	820 nm	50/125 µm	0-9,5 dB	0-2,1 km	3.0 dB/km; 400 MHz*km
-F4	MM	820 nm	62.5/125 µm	0-12.5 dB	0-3,0 km	3.2 dB/km; 200 MHz*km

Table 13: F/O port 10BASE-FL

Product code		Wave-length	Fiber	System attenua-tion	Expan-sion	Fiber data
-M2, -M4	MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
-M2, -M4	MM	1300 nm	62.5/125 µm	0-11 dB	0-2.49 mi	1.0 dB/km, 500 MHz*km
-S2	SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km; 3.5 ps/(nm*km)
-L2	LH	1550 nm	9/125 µm	7-29 dB	24-86 km	0.3 dB/km; 19 ps/(nm*km)
-P4	MM POF	650 nm	980/1000 µm	0-15.5 dB	0-65 m	200 dB/km; 10 MHz*km
-P4	MM HCS	650 nm	200/230 µm	0-7 dB	0-140 m	10 dB/km; 17 MHz*km
-P9	MM POF	650 nm	980/1000 µm	0-14.0 dB	0-55 m	200 dB/km; 10 MHz*km
-G2	LH+	1550 nm	9/125 µm	14-47 dB	67-176 km	0.25 dB/km; 19 ps/(nm*km)

Table 14: F/O port 100BASE-FX

Product code		Wave-length	Fiber	System at-tenuation	Example for F/O line length	Fiber data
-SX/LC	MM	850 nm	50/125 µm	0-7.5 dB	0-550 m	3.0 dB/km, 400 MHz*km
-LX/LC	MM	1310 nm[1]	50/125 µm	0-11 dB	0-550 m	1.0 dB/km, 800 MHz*km
-SX/LC	MM	850 nm	62.5/125 µm	0-7.5 dB	0-275 m	3.2 dB/km, 200 MHz*km
-LX/LC	MM	1310nm[1]	62.5/125 µm	0-11 dB	0-550 m	1.0 dB/km, 500 MHz*km
-LX/LC	SM	1310 nm	9/125 µm	0-11 dB	0-20 km	0.4 dB/km; 3.5 ps/(nm*km)
-LH/LC	LH	1550 nm	9/125 µm	6-22 dB	24-72 km	0.25 dB/km; 19 ps/(nm*km)
-LH/+LC	LH	1550 nm	9/125 µm	15-32 dB	60-120 km	0.25 dB/km; 19 ps/(nm*km)

Table 15: F/O port 1000BASE-FX

1. With F/O adapter compliant with IEEE 802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)

MM = multi-mode
SM = single-mode
LH = long haul

Power consumption/power output, temperature range and order numbers

For order numbers of the MICE basic modules see table: (see on page 14 "Combination options of the MS20/MS30 device versions").

Basic module	Operating temperature (ambient air temperature)
MS20-800S...	0°C to +60 °C
MS20-800E...	-40 °C to +70 °C
MS30-802S...	0°C to +60 °C
MS30-802E...	-40 °C to +70 °C
MS20-1600S...	0°C to +60 °C
MS20-1600E...	-40 °C to +70 °C
MS30-1602S...	0°C to +60 °C
MS30-1602E...	-40 °C to +70 °C
MS20-2400S...	0°C to +60 °C
MS20-2400E...	-40 °C to +70 °C
MS30-2402S...	0°C to +60 °C
MS30-2402E...	-40 °C to +70 °C

Basic module	Power consumption	Power output	Operating voltage
MS20-0800...A...	5.0 W	17.1 Btu (IT)/h	18-32 V DC
MS20-0800...C...	7.4 W	25.4 Btu (IT)/h	18-60 V DC
MS30-0802...A...	5.6 W	19.2 Btu (IT)/h	18-32 V DC
MS30-0802...C...	8.6 W	29.6 Btu (IT)/h	18-60 V DC
MS20-1600...A...	12.0 W	40.0 Btu (IT)/h	18-32 V DC
MS20-1600...C...	15.6 W	52.2 Btu (IT)/h	18-60 V DC
MS30-1602...A...	12.6 W	41.1 Btu (IT)/h	18-32 V DC
MS30-1602...C...	16.8 W	56.7 Btu (IT)/h	18-60 V DC
MS20-2400...A...	12.0 W	40.0 Btu (IT)/h	18-32 V DC
MS20-2400...C...	16.8 W	56.7 Btu (IT)/h	18-60 V DC
MS30-2402...A...	12.6 W	42.1 Btu (IT)/h	18-32 V DC
MS30-2402...C...	18.0 W	60.9 Btu (IT)/h	18-60 V DC

Media modules	Power consumption	Power output	Operating temperature (ambient air temperature)	Order number
Media modules MICE 2000:				
MM2 - 4TX1	0.8 W	2.8 Btu (IT)/h	0 °C to +60 °C	943 722-101
MM2 - 4TX1 - EEC	0.8 W	2.8 Btu (IT)/h	-40 °C to +70 °C	943 722-051
MM2 - 2FXP4	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 842-101
MM2 - 4FXM3	7.0 W	23.9 Btu (IT)/h	0 °C to +60 °C	943 721-101
MM2 - 2FXM3 / 2TX1	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 720-101
MM2 - 2FXM2	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 718-101
MM2 - 2FXS2	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 719-101

Table 16: Power, temperature and order numbers

Media modules	Power consumption	Power output	Operating temperature (ambient air temperature)	Order number
Media modules MICE 3000:				
MM3 - 2AUI	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 840-101
MM3 - 4FLM4	5.0 W	17.1 Btu (IT)/h	0 °C to +60 °C	943 760-101
MM3 - 2FLM4 / 2TX1 - RT	5.0 W	17.1 Btu (IT)/h	0 °C to +55 °C	943 117-004
MM3 - 4TX5	0.8 W	2.8 Btu (IT)/h	0 °C to +60 °C	943 841-101
MM3 - 4TX1 - RT	0.8 W	2.8 Btu (IT)/h	0 °C to +55 °C	943 117-001
MM3 - 4FXP4	7.0 W	23.9 Btu (IT)/h	0 °C to +60 °C	943 843-101
MM3 - 1FXM2 / 3TX1	2.2 W	7.5 Btu (IT)/h	0 °C to +60 °C	943 839-101
MM3 - 1FXM2 / 3TX1 - EEC	2.2 W	7.5 Btu (IT)/h	-40 °C to +70 °C	943 839-051
MM3 - 2FXM2 / 2TX1	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 761-101
MM3 - 2FXM2 / 2TX1 - EEC	3.4 W	11.6 Btu (IT)/h	-40 °C to +70 °C	943 761-051
MM3 - 2FXM2 / 2TX1 - RT	3.4 W	11.6 Btu (IT)/h	0 °C to +55 °C	943 117-002
MM3 - 2FXM4 / 2TX1	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 837-101
MM3 - 4FXM2	7.0 W	23.9 Btu (IT)/h	0 °C to +60 °C	943 764-101
MM3 - 4FXM4	7.0 W	23.9 Btu (IT)/h	0 °C to +60 °C	943 835-101
MM3 - 1FXS2 / 3TX1	2.2 W	7.5 Btu (IT)/h	0 °C to +60 °C	943 838-101
MM3 - 2FXS2 / 2TX1	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 762-101
MM3 - 2FXS2 / 2TX1 - RT	3.4 W	11.6 Btu (IT)/h	0 °C to +55 °C	943 117-003
MM3 - 4FXS2	7.0 W	23.9 Btu (IT)/h	0 °C to +60 °C	943 836-101
MM3 - 1FXL2 / 3TX1	3.4 W	11.6 Btu (IT)/h	0 °C to +60 °C	943 763-101
Media modules MICE 4000:				
MM4 - 4TX / SFP	9.0 W	30.8 Btu (IT)/h	0 °C to +60 °C	943 010-101
MM4 - 2TX / SFP	5.8 W	19.8 Btu (IT)/h	0 °C to +60 °C	943 622-101
Media modules MICE open variant:				
MM20-... 4 TX-/0 FX ports	0.8 W	2.8 Btu (IT)/h	see table 17	see table 17
MM20-... 3 TX-/1 FX ports	2.3 W	7.9 Btu (IT)/h	- “ -	- “ -
MM20-... 2 TX-/2 FX ports	3.8 W	13.0 Btu (IT)/h	- “ -	- “ -
MM20-... 0 TX-/2 FX ports	3.8 W	13.0 Btu (IT)/h	- “ -	- “ -
MM20-... 1 TX-/3 FX ports	5.3 W	18.1 Btu (IT)/h	- “ -	- “ -
MM20-... 0 TX-/4 FX ports	6.8 W	23.2 Btu (IT)/h	- “ -	- “ -
MM20-A8A89999...	3.4 W	11.6 Btu (IT)/h	- “ -	- “ -
MM20-F4F4F4F4...	5.0 W	17.1 Btu (IT)/h	- “ -	- “ -
MM20-Z6Z6Z6Z6...	8.0 W	27.3 Btu (IT)/h	- “ -	- “ -
MM20-P9P9P9P9SAHH	8.0 W	27.3 Btu (IT)/h	0 °C to +60 °C	- “ -
MM20-P9P9T1T1SAHH	5.2 W	17.8 Btu (IT)/h	0 °C to +60 °C	- “ -
MM30-O7O7O7O7...	9.0 W	30.8 Btu (IT)/h	see table 17	- “ -
MM30-O7O79999...	5.8 W	19.8 Btu (IT)/h	- “ -	- “ -
MM21-T1T1T1T1...	0.8 W	2.8 Btu (IT)/h	- “ -	- “ -
MM21-F4F4T1T1...	5.0 W	17.1 Btu (IT)/h	- “ -	- “ -
MM21-M2M2T1T1...	3.8 W	13.0 Btu (IT)/h	- “ -	- “ -
MM21-S2S2T1T1...	3.8 W	13.0 Btu (IT)/h	- “ -	- “ -

Table 16: Power, temperature and order numbers

Media modules	Power consumption	Power output	Operating temperature (ambient air temperature)	Order number
MM22-T1T1T1T1 - internal operating voltage - external PoE voltage - no PD - 4 x class0-PD	 0.8 W 1.3 W 2 W + PDs	 2.8 Btu (IT)/h 4.3 Btu (IT)/h 6.9 Btu (IT)/h	- “ -	- “ -
MM23-T1T1T1T1...SAHH	4.5 W	15.4 Btu (IT)/h	0 °C to +60 °C	- “ -
MM23-M2M2T1T1...SAHH	6.0 W	20.5 Btu (IT)/h	0 °C to +60 °C	- “ -
MM23-S2S2T1T1...SAHH	5.5 W	18.8 Btu (IT)/h	0 °C to +60 °C	- “ -
MM23-F4F4T1T1...SAHH	5.5 W	18.8Btu (IT)/h	0 °C to +60 °C	- “ -
MM33-O7O79999...SAHH	7.5 W	25.6 Btu (IT)/h	0 °C to +60 °C	- “ -
Expansion module:				
MB - 2T	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 733-102
Fast ETHERNET SFP modules:				
M-FAST SFP-MM / LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 865-001
M-FAST SFP-MM / LC EEC	0 W	0 Btu (IT)/h	-40 °C to +70 °C	943 945-001
M-FAST SFP-SM / LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 866-001
M-FAST SFP-SM / LC EEC	0 W	0 Btu (IT)/h	-40 °C to +70 °C	943 946-001
M-FAST SFP-SM+/ LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 867-001
M-FAST SFP-SM+/ LC EEC	0 W	0 Btu (IT)/h	-40 °C to +70 °C	943 947-001
M-FAST SFP-LH / LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 868-001
Gigabit ETHERNET SFP modules:				
M-SFP-SX / LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 014-001
M-SFP-SX / LC EEC	0 W	0 Btu (IT)/h	-40 °C to +70 °C	943 896-001
M-SFP-LX / LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 015-001
M-SFP-LX / LC EEC	0 W	0 Btu (IT)/h	-40 °C to +70 °C	943 897-001
M-SFP-LH / LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 042-001
M-SFP-LH / LC EEC	0 W	0 Btu (IT)/h	-40 °C to +70 °C	943 898-001
M-SFP- LH+/LC	0 W	0 Btu (IT)/h	0 °C to +60 °C	943 049-001

Table 16: Power, temperature and order numbers

Open variant product code

As an alternative to the order number (see in table 16, last column) you can use the product code. This gives you a wider range of variants when selecting the media module that is specially tailored to your requirements. The product code of your media module is made from combining the desired product characteristics in accordance with the following table. The short designation is in "Ident." column. Example: Product code MM30-O7O7O7O7SA = media module 1000 Mbit/s with four Gigabit Ethernet combo ports (four SFP ports or alternatively TP ports RJ45). This example corresponds to the MM4-4TX/SFP module with the order number 943 010-001.

Item	Characteristic feature	Ident.	Property
1 to 4	Product	MM20	Media module 10/100 Mbit/s (standard)
		MM21	Media module 10/100 Mbit/s (realtime)
		MM22	Media module 10/100 Mbit/s (Power over Ethernet)
		MM23	Media module 10/100 Mbit/s (PTP version 2)
		MM30	Media module 1000 Mbit/s (standard)
		MM33	Media module 1000 Mbit/s (PTP version 2)
5	- (hyphen)	-	
6 to 7	1st port (medium/connector)	T1	Twisted pair (TX) / RJ45
		T5	Twisted pair (TX) / M12
		M2	Multi-mode FX DSC (100 Mbit/s)
		M3	Multi-mode FX MTRJ (100 Mbit/s)
		M4	Multi-mode FX ST (100 Mbit/s)
		S2	Single-mode FX DSC (100 Mbit/s)
		S4	Single-mode FX ST (100 Mbit/s)
		L2	Single-mode Long Haul FX DSC (100 Mbit/s)
		G2	Single-mode Long Haul FX DSC 200km (only100 Mbit/s)
		F4	Multi-mode FL ST (10 Mbit/s)
		P4	POF FX ST (100 Mbit/s)
		P9	POF FX SCRJ (100Mbit/s)
		O7	Combo port Gigabit Ethernet (SFP 1000 Mbit/s)
		A8	AUI Sub-D
		Z6	Fiber optic / SFPslot (100 Mbit/s)
8 to 9	2nd port (medium/connector)	...	See items 6 to 7
10 to 11	3rd port (medium/connector)	...	See items 6 to 7
		99	Empty
12 to 13	4th port (medium/connector)	...	See items 6 to 7
		99	Empty
14	Temperature range	S	Standard: operation 0 °C to +60 °C; storage -40 °C to +70 °C
		T	Extended: operation -40 °C to +70 °C; storage -40 °C to +85 °C
		E	Extended: operation -40 °C to +70 °C; storage -40 °C to +85 °C, with Conformal Coating
15	Certifications	A	CE, UL 508, ISA 12.12.01 (UL 1604)
		H	A plus GL, IEC 61850, IEEE 1613 Sub-station, EN 50121-4 Railway (along track)
		B	H plus ATEX100a

Table 17: Combination possibilities of the MM20/MM30 media module variants

Interfaces

MICE MS20-..., MS30-...	V.24 port: external management, AutoConfiguration Adapter ACA 11 2 terminal blocks 4-pin: 1 x indicator contact each, 1 A maximum, 24 V 1 x voltage supply each USB: ACA 21-USB
MICE MS20-...E..., MS30-...E...	V.24 port: external management, AutoConfiguration Adapter ACA 11 1 terminal block 6-pin: 1 x indicator contact each, 1 A maximum, 24 V 1 x voltage supply each USB: ACA 21-USB
MICE 2000 media modules	see table "MICE 2000 media modules" on page 20
MICE 3000 media modules	see table "MICE 3000 media modules" on page 20
MICE 4000 media modules	see table "MICE 4000 media modules" on page 21

Scope of delivery

Device	Scope of delivery
MICE MS20-.../MS30-...	MS20-.../MS30-... Device Terminal block for supply voltage and signal contact: - 2 terminal blocks, 4-pin for MS20-.../MS30-... - 1 terminal block, 6-pin for MS20-...E.../MS30-...E... CD ROM with user manual ML-MS2/MM labels Installation user manual

Accessories

Note: Please note that product recommended as accessories may have characteristics that do not fully correspond to those of the corresponding product. This may limit their possible usage in the overall system.

Name	Order number
AutoConfiguration Adapter ACA 21-USB	943 271-001
Terminal cable	943 301-001
4-pin terminal block (50 units)	943 845-004
6-pin terminal block (50 units, for MS20/MS30-...E...)	943 845-002
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC	943 662-120
Rail Power Supply RPS60/48V EEC (for Power over Ethernet)	943 952-001
ML-MS2/MM labels	943 767-001
ML-MS3 labels	943 768-001
HiVision network management software	943 471-100
Netzmanagement Software Industrial HiVision	943 156-xxx
OPC-Server software HiOPC	943 055-001

Underlying norms and standards

Name	
EN 61000-6-2:2005	Generic norm – immunity in industrial environments
EN 55022:2006	IT equipment – radio interference characteristics
IEC/EN 60950-1:2006	Safety for the installation of IT equipment
EN 61131-2:2003	Programmable logic controllers
EN 50121-4:2000	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
FCC 47 CFR Part 15:2006	Code of Federal Regulations
German Lloyd	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003
cUL 508:1998	Safety for Industrial Control Equipment
ISA 12.12.01 (cUL 1604), CSA C22.2 No. 213	Electrical Equipment for Use in Class I and Class II, Div.2 and Class III Hazardous (Classified) Locations
EN 60079-15	Electrical equipment for explosive gas atmospheres – part 15: Construction, testing and marking of protection type "n" electrical apparatus.
EN 50155	Declaration (Railway) [1] [2]
IEC/EN 61850-3	Communications networks and systems in stations
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations

Table 18: List of based specifications and standards. Certified devices are marked with a certification identifier.

1. Devices with C specification (see product code position 16 in table 1) (MS20-0800ECCP, MS20-1600ECCP)
2. Restriction: Electrical isolation on voltage input: see table entry „Isolating voltage between operating voltage connec-tors and housing“ in chapter Technical data (see page 45)

RFC 768	UDP	RFC 1769	SNTP
RFC 783	TFTP	RFC 1907	MIB2
RFC 791	IP	RFC 1945	HTTP/1.0
RFC 792	ICMP	RFC 2131	DHCP
RFC 793	TCP	RFC 2132	DHCP Options
RFC 826	ARP	RFC 2236	IGMPv2
RFC 951	BOOTP	RFC 2239	MAU-MIB
RFC 1112	IGMPv1	RFC 3411	SNMP Framework
RFC 1157	SNMPv3	RFC 3412	SNMP MDP
RFC 1155	SMIv1	RFC 3413	SNMP Applications
RFC 1213	MIB2	RFC 3414	SNMP USM
RFC 1493	Dot1d	RFC 3415	SNMP VACM
RFC 1542	BOOTP Extensions	RFC 2613	SMON
RFC 1757	RMON	RFC 2674	Dot1p/Q

Table 19: List of RFCs

IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1 Q	Tagging
IEEE 802.1 Q-1998	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.1 w.2001	Rapid Reconfiguration
IEEE 802.3-2002	Ethernet

Table 20: List of IEEE standards

Certifications

The following table shows the status of the certification of the equipment.

Standard	
cUL 508 / CSA C22.2 No.142	
ISA 12.12.01 (cUL 1604) / CSA C22.2 No.213	pending
German Lloyd	pending

Table 21: Certifications, see www.hirschmann.com for current status

A Further support

Technical questions and training courses

In the event of technical queries, please contact your local Hirschmann distributor or Hirschmann office.
You can find the addresses of our distributors on the Internet: www.hirschmann-ac.com.

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- Fax +49 7127 14-1551

Answers to Frequently Asked Questions can be found on the Hirschmann internet site (www.hirschmann-ac.com) at the end oft the product sites in the FAQ category.
The current training courses to technology and products can be found under http://www.hicomcenter.com.

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